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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

BELL, MELTIN

ART UNIT PAPER NUMBER

2121

DATE MAILED: 07/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/939,128

Applicant(s)

CHILD ET AL.

Examiner

Meltin Bell

Art Unit

2121

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 22 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 April 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

This action is responsive to application **09/939,128** filed **8/24/01** as well as the Drawing Corrections filed 4/22/04 and Amendment A filed 4/22/04. Claims 1-12 filed by the applicant have been entered and examined. An action on the merits of claims 1-12 appears below.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the Office presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the Office to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 1-12 are rejected under 35 U.S.C. 103(a) as being obvious over *Nakayama et al* USPN 5,732,001 (March 24, 1998) in view of *Reboh et al* USPN 4,866,634 (September 12, 1989).

**Regarding claim 1:**

*Nakayama et al* teaches,

- a screen capable of displaying mathematical expressions (Fig. 1, item 2)
- a key panel having keys operating the calculator and entering user responses (Fig. 1, items 3, 3a-k, 3m, 4, 5, 5a; Fig. 51)
- a processor for executing programming that provides a user interface to assist the user in learning to solve a mathematical symbolic calculation problem (Fig. 2, item 10)
- programming which provides a set of transformations for a mathematical object that the user can choose from and apply to the mathematical object to produce the next step in a solution to the problem (Abstract, "An improved educational ... effects of learning"; Figs. 3, 8, 13, 17, 21, 41-50, 52; column 10, lines 5-12, "The ROM 12 stores ... an operation buffer 13g")

However, *Nakayama et al* doesn't explicitly teach expert programming while *Reboh et al* teaches,

- expert programming (Abstract, "An improved educational ... effects of learning"; column 1, lines 12-15, "Expert systems are ... the end user")

Motivation – The portions of the claimed device would have been a highly desirable feature in this art for

- Improved learning (*Nakayama et al*, column 4, lines 35-57, "With this arrangement ... portable electronic apparatuses")
- Convenience and efficiency (*Reboh et al*, column 2, lines 45-64, "A basic object ... at run time")

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to modify *Nakayama et al* as taught by *Reboh et al* for the purpose of conveniently and efficiently improving learning.

**Regarding claim 2:**

The rejection of claim 2 is similar to that for claim 1 as recited above since the stated limitations of the claims are set forth in the references. Claim 2's limitations difference is taught in *Nakayama et al*:

- said processor is further programmed to allow transformations of the mathematical object that are valid mathematically, but do not lead to the solution of the problem (column 20, lines 53-67, "With this arrangement ... the advance key 3f"; Figs. 34, 38, 44-45, 49-50)

**Regarding claim 3:**

The rejection of claim 3 is similar to that for claim 2 as recited above since the stated limitations of the claims are set forth in the references. Claim 3's limitations difference is taught in *Nakayama et al*:

- said processor is further programmed to pause after the user selects the transformation before applying the transformation to the problem (column 4, lines 1-23, "an advance key ... answers are found"; column 13, lines 62-67, "the present embodiment ... the solution key 3b")

**Regarding claim 4-5:**

The rejection of claims 4-5 is similar to that for claim 3 as recited above since the stated limitations of the claims are set forth in the references. Claim 4-5's limitations difference is taught in *Nakayama et al*:

- said processor is further programmed to clean-up the result of a previous transformation in response to the user pressing a key, where clean-up consists of arithmetic and other basic simplification appropriate for the problem (Fig. 1, ON/C and DEL keys; Fig. 2, item 13c; Fig. 27, items 23i, 3i-k)

**Regarding claim 6:**

The rejection of claim 6 is similar to that for claims 4-5 as recited above since the stated limitations of the claims are set forth in the references. Claim 6's limitations difference is taught in *Nakayama et al*:

- said processor is further programmed to provide a set transformation tools for a mathematical sub-object that the user can choose from and apply to the mathematical sub-object in a selection box to product the next step in a solution to the problem (column 13, lines 62-67, "the present embodiment ... the solution key 3b")

**Regarding claim 7:**

*Nakayama et al* teaches,

- a screen capable of displaying mathematical expressions (Fig. 1, item 2)
- a key panel having keys operating the calculator and entering user responses (Fig. 1, items 3, 3a-k, 3m, 4, 5, 5a; Fig. 51)

- a processor for executing programming that provides a user interface to assist the user in learning to solve a mathematical symbolic calculation problem (Fig. 2, item 10)

- programming which provides a set of transformations for a mathematical object that the user can choose from and apply to the mathematical object to produce the next step in a solution to the problem (Abstract, "An improved educational ... effects of learning"; Figs. 3, 8, 13, 17, 21, 41-50, 52; column 10, lines 5-12, "The ROM 12 stores ... an operation buffer 13g")

However, *Nakayama et al* doesn't explicitly teach expert programming while *Reboh et al* teaches,

- expert programming (Abstract, "An improved educational ... effects of learning"; column 1, lines 12-15, "Expert systems are ... the end user")

Motivation – The portions of the claimed device would have been a highly desirable feature in this art for

- Improved learning (*Nakayama et al*, column 4, lines 35-57, "With this arrangement ... portable electronic apparatuses")
- Convenience and efficiency (*Reboh et al*, column 2, lines 45-64, "A basic object ... at run time")

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to modify *Nakayama et al* as taught by *Reboh et al* for the purpose of conveniently and efficiently improving learning.

**Regarding claim 8:**

The rejection of claim 8 is similar to that for claim 7 as recited above since the stated limitations of the claims are set forth in the references. Claim 8's limitations difference is taught in *Nakayama et al*:

- said processor is further programmed to allow transformations of the mathematical object that are valid mathematically, but do not lead to the solution of the problem (column 20, lines 53-67, "With this arrangement ... the advance key 3f"; Figs. 34, 38, 44-45, 49-50)

**Regarding claim 9:**

The rejection of claim 9 is similar to that for claim 8 as recited above since the stated limitations of the claims are set forth in the references. Claim 9's limitations difference is taught in *Nakayama et al*:

- said processor is further programmed to pause after the user selects the transformation before applying the transformation to the problem (column 4, lines 1-23, "an advance key ... answers are found"; column 13, lines 62-67, "the present embodiment ... the solution key 3b")

**Regarding claim 10-11:**

The rejection of claims 10-11 is similar to that for claim 9 as recited above since the stated limitations of the claims are set forth in the references. Claim 10-11's limitations difference is taught in *Nakayama et al*:

- said processor is further programmed to clean-up the result of a previous transformation in response to the user pressing a key, where clean-up consists of

arithmetic and other basic simplification appropriate for the problem (Fig. 1, ON/C and DEL keys; Fig. 2, item 13c; Fig. 27, items 23i, 3i-k)

**Regarding claim 12:**

The rejection of claim 12 is similar to that for claims 10-11 as recited above since the stated limitations of the claims are set forth in the references. Claim 12's limitations difference is taught in *Nakayama et al*:

- said processor is further programmed to provide a set transformation tools for a mathematical sub-object that the user can choose from and apply to the mathematical sub-object in a selection box to product the next step in a solution to the problem (column 13, lines 62-67, "the present embodiment ... the solution key 3b")

**RESPONSE TO APPLICANTS' AMENDMENT A REMARKS**

Applicant(s) argue(s) that no claims changes were made (Amendment A page 2, paragraph 1).

***Drawings***

Applicant(s) argue(s) that the amended drawings filed 4/22/04 incorporate changes requested by the Examiner (Amendment A REMARKS page 5, paragraph 3).

The amendments to the drawings (Figs. 1-3d) have been entered and examined. The objections to the drawings in the prior office action are withdrawn. However, it is noted that the Shift key in Fig. 3a, item 116 is not explained in the specification or other drawings.

***Claim Rejections - 35 USC § 102***

Applicant(s) argue(s) that Smith et al (USPN 5,046,024) does not anticipate the claimed invention in regards to the 35 U.S.C. §102(b) rejection of claims 1-12

(Amendment A REMARKS page 5, paragraph 4).

The examiner agrees that Smith et al does not teach or suggest the claimed invention and withdraws the 35 U.S.C. §102(b) rejection of claims 1-12. However, *Nakayama et al* USPN 5,732,001 and *Reboh et al* USPN 4,866,634 are cited in combination for explicitly and inherently disclosing the subject matter set forth in the claims by the applicants.

Applicant(s) argue(s) that the cited prior art does not teach the expert programming limitation (Amendment A REMARKS page 5, paragraph 5), discuss transformations, and allow the user to select a transformation or even describe or relate to solving a mathematical problem by the user (Amendment A REMARKS page 6, paragraph 2).

Applicants' arguments are not agreed with as 1) *Nakayama et al* discloses programming transformations, allowing the user to select a transformation and solving a mathematical problem by the user in Figs. 1-3, 8, 13, 17, 21, 34, 38,41-52, the Abstract, column 10, lines 5-12, column 13, lines 62-67 and column 20, lines 53-67 and 2) *Reboh et al* discloses expert programming in the Abstract and column 1, lines 12-15.

As set forth above with regards to *Nakayama et al* and *Reboh et al*, the items listed explicitly and inherently teach the applicants' claimed limitations. Applicants have not set forth any distinction or offered any dispute between the claims of the subject application, *Nakayama et al's* Calculator with stepwise display of linear equations and *Reboh et al's* Data-driven, functional expert system shell.

### **Conclusion**

The prior art made of record and not relied upon is considered pertinent to the applicant's disclosure:

- *Nakayama et al*; USPN 5,732,001; Calculator with stepwise display of linear equations

Any inquiry concerning this communication or earlier communications from the Office should be directed to Melvin Bell whose telephone number is 703-305-0362. This Examiner can normally be reached on Mon - Fri 7:30 am - 4:30 pm.

If attempts to reach this Examiner by telephone are unsuccessful, his supervisor, Anthony Knight, can be reached on 703-308-3179. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

  
**Anthony Knight**  
Supervisory Patent Examiner  
Group 3600

MB/AMH